## Laucks Testing Laboratories, Inc.



LABORATORY NO. 7986

DATE: Feb. 9, 1988

PO #M4883

940 South Harney St., Seattle, Washington 98108 (206)767-5060

Chemistry. Microbiology, and Technical Services

CLIENT: Alaskan Copper Works

P.O. Box 3546

Seattle, WA 98124

ATTN:

Jim Brown

REPORT ON: LIQUID

SAMPLE

IDENTIFICATION: Submitted 1/27/88 and identified as shown:

ID #3200 - M4883

parts per million (mg/L)

 Zinc
 0.10

 Chromium
 <0.005</td>

 Copper
 0.19

 Nickel
 0.01

Key

< = less than

Respectfully submitted,

Laucks Testing Laboratories, Inc.

7. M. Owens

JMO:veg



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Certificate

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940 South Harney St., Seattle. Washington 98108 (206)767-5060

Chemistry, Microbiology, and Technical Services

CLIENT: Alaskan Copper Works

P.O. Box 3546 Seattle, WA 98124 ATTN: Jim Brown LABORATORY NO. 7657

DATE: Jan. 13, 1988

PO# M4691

REPORT ON: LIQUID

SAMPLE

IDENTIFICATION: Submitted 01/07/88 and identified as shown below:

ID# 3200-M4691

TESTS PERFORMED AND RESULTS:

Specific Gravity @ 70°F ----- 0.999

Total Acidity calculated as, % HNO3 (methyl orange end point) ----- <0.03\*

\*pH is 10.9 and no acidity is present

Key

< indicates "less than"

Respectfully submitted,

Laucks Testing Laboratories, Inc.

ឋ. M. Owens

JMO:emt



# Laucks Testing Laboratories, Inc. 940 South Harney St.. Seattle. Washington 98108 (206) 767-5060

Certificate

Chemistry. Microbiology. and Technical Services

CLIENT: Alaskan Copper Works

P.O. Box 3546 Seattle, WA 98124 ATTN: Jim Brown LABORATORY NO. 7657

DATE: Jan. 13, 1988

PO# M4691

REPORT ON: LIQUID

**SAMPLE** 

IDENTIFICATION: Submitted 01/07/88 and identified as shown below:

ID# 3200-M4691

TESTS PERFORMED AND RESULTS:

WRONG TEST -SHOULD HAVE BEEN FOR HEAVY METALS

Specific Gravity @ 70°F ----- 0.999

Total Acidity calculated as, % HNO3 (methyl orange end point) ----- <0.03\*

\*pH is 10.9 and no acidity is present

Key

< indicates "less than"

Respectfully submitted,

Laucks Testing Laboratories, Inc.

J. M. Owens

JMO:emt



# Laucks Testing Laboratories, Inc. 940 South Harney St., Seattle, Washington 98108 (206)767-5060



Certificate

Chemistry Microbiology and Technical Services

CLIENT: Alaskan Copper Works

P.O. Box 3546 Seattle, WA 98124 ATTN: Jim Brown LABORATORY NO. 7657

DATE: Jan. 13, 1988

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< indicates "less than"

Respectfully submitted.

Laucks Testing Laboratories, Inc.

y. M. Owens

JMO:emt



## Testing Laboratories, Inc.



LABORATORY NO. 7658

DATE: Jan. 18, 1988

PO No. M4692

940 South Harney St., Seattle, Washington 98108 (206)767-5060

Chemistry Microbiology, and Technical Services

CLIENT: Alaskan Copper Works

P.O. Box 3546 Seattle, WA 98124 ATTN: Jim Brown

REPORT ON:

LIQUID

SAMPLE

**IDENTIFICATION:** 

Submitted 1/07/88 and identified as shown below:

ID# 3600-M4692

TESTS PERFORMED AND RESULTS:

parts per million (mg/L)

Zinc Chromium Copper Nickel

7.3 0.048 0.037 1.0

Respectfully submitted,

Laucks Testing Laboratories, Inc.

M. Owens

JMO: laj



### Testing Laboratories, Inc.

Certificate

LABORATORY NO. 7658

DATE: Jan. 18, 1988

940 South Harney St., Seattle, Washington 98108 (206)767-5060

Chemistry. Microbiology, and Technical Services

CLIENT: Alaskan Copper Works

P.O. Box 3546 Seattle, WA 98124 ATTN: Jim Brown

PO No. M4692

REPORT ON:

LIQUID

SAMPLE

**IDENTIFICATION:** 

Submitted 1/07/88 and identified as shown below:

ID# 3600-M4692

TESTS PERFORMED AND RESULTS:

parts per million (mq/L)

Zinc Chromium Copper Nickel

7.3 0.048 0.037 1.0

Respectfully submitted,

Laucks Testing Laboratories, Inc.

JMO: laj



### Laucks Testing Laboratories, Inc.



LABORATORY NO. 7658

DATE: Jan. 18, 1988

PO No. M4692

940 South Harney St., Seattle, Washington 98108 (206)767-5060

Chemistry Microbiology, and Technical Services

CLIENT: Alaskan Copper Works

P.O. Box 3546 Seattle, WA 98124

ATTN: Jim Brown

REPORT ON:

LIQUID

SAMPLE

IDENTIFICATION:

Submitted 1/07/88 and identified as shown below:

ID# 3600-M4692

TESTS PERFORMED AND RESULTS:

parts per million (mq/L)

Zinc Chromium Copper Nickel 7.3 0.048 0.037 1.0

Respectfully submitted,

Laucks Testing Laboratories, Inc.

JMO: laj

J. M. Owens



ALASKAN COPPER CO. WEEKLY EFFLUENT REPORT
STARTING 1, 4,83 LOCATION 3200 AM 5. ENDING 1, 8,83 TECHNICIAN Duck Total of Gals Used weekly Ph paper Almost outer X 1.7 = 27.2 Sys Running By Tony Did Regular Daties most and it BIR leak, in. 18.50 Tony Arrived early & turned pumps on System is ok 500 BIR leaks for Sure BARRELS Are All ful & Need Dumping Noon Going to let SXS, Rum until Noon # mon then complete clean out Hed (wed (whe cleaned Aven Did chares
There on # 2 hopper was stock shirt Trick out New Sedement Silter Bag 4 Let set for 24 hrs.

File Bas Seemed to work

need to let it settle more

Most all barrells are full added 3 more

& chained tops of all.

Retilled Beta - flor

Need to buy more barrello & make more
Bag Stands Deptem is Aok
Going to completly to Class entire System

-ASKAN COPPER CO. WEEKLY EFFLUENT REPORT STARTING LOCATION 3200 Are S. ENDING 1, 15,88 TECHNICIAN Duck Total of Gals Used weekly 6.75 × 1.7 = 11.475 gals System Ran Sat NAOH is really low time for Reall constic sys Barrel Cycled 90 times must Be Monitor malfondioning need to see Tresday CARY Bullard to help inspect BIR Leaks for Sore in. 2.50 Ph probe in process Sump Rec 1 to 28.50 must need to the cleaned through it can't Achieve Thesired ph even though it ues is cycling Repeatedly Bulland has process probe apart I'm checking the System Manually every hour Didall chores & cleaned over a Resilled NAOH Cycles 4 man Jim Cheeled the Wew til ter Bags System in ok eard. Charling process sent manually

Thurs

yourd uses Clooded & The of meto somp was Low / Drained all boursells tops & Tunned, down Clood BIR wouldn't light for 1/2 hr. The meder is now breng Installed

Soil

All Borrels Drained

All System's checked

All Duties Dome

BIR OK Mow Timmer Rt. Orr

Tony torned pumps on county time to Lock

Room Bod op checked probes to paper

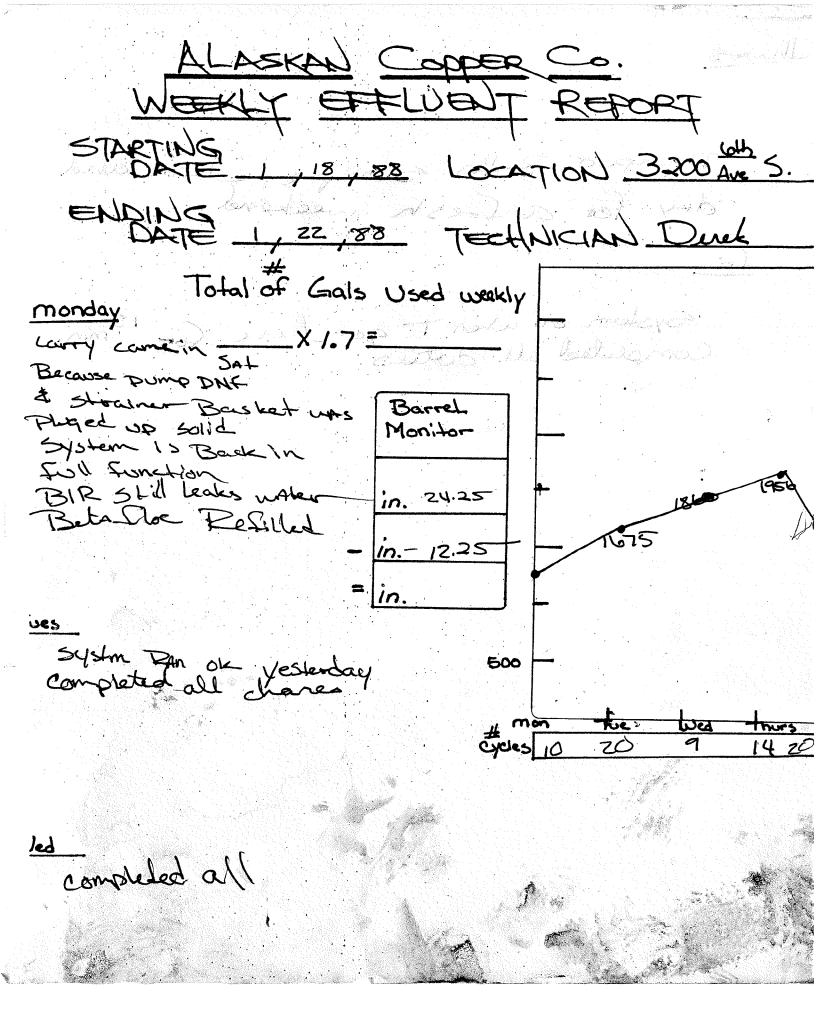
Modroblems gary's Hooking up process probe

The transfer will be the second of the second

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- BOD NO ME MARKET

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-ASKAN COPPER CO. WEEKLY EFFLUENT REPORT STARTING 1,25,88 LOCATION 3200 Am S. ENDING DATE 1, 31, 88 TECHNICIAN Duck Total of Gals Used weekly 8.5 × 1.7 = 14.45 Ronning out of Space for Daniello roed to be Buy New Monitor Syptem is running Aok in.12.25 moved all Barrells in. 375 in Sport of Shock tor optimum space in.8.5 need Southon Soon 500 Sys was on voy long Has meter DWF Cleaned entire Are Cycles 10 BIK Leaks So Sar 57 barrells to many Moved Barrels into Cleaned Drea Ose Treat Did Duties

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ALASKAN COPPER CO.
WEEKLY EFFLUENT REPORT
STARTING / A/80 LOCATION 3600
ENDING / 8/80 TECHNICIAN GR 6,482 GALLONS OF WASTE EFFLUENT 52 cycles of Nool 34 GALLONS OF NaOH REMAIN.

ALASKAN COPPER CO.
WEEKLY EFFLUENT REPORT
STARTING 1/1880 LOCATION 36000
ENDING 1/18/80 TECHNICIAN SP 10,377 GALLONS OF WASTE BETWENT 51 cycles of NaOH 31 GALLONS OF NaOH REMAIN

ALASKAN COPPER CO.
WEEKLY EFFLUENT REPORT
STARTING 1/18/88 LOCATION 3600
ENDING 1/22/88 TECHNICIAN SIR 9575 GALLONS OF WARTE EFFLUENT 70 cycles of NgOH 26 GALLONS OF NaOH REMAIN

ALASKAN COPPER CO.

WEEKLY EFFLUENT REPORT

STARTING 1/88 LOCATION 3600

ENDING 1/29/88 TECHNICIAN GB 4,638 GALLONS OF WASTE EFFLUENT 86 cycles of Nash 20 GALLONS OF NaOH REMAIN



### Waste Discharge Self Monitoring Report (Report On Only Those Parameters Specified By Your Permit)

Mail to Metro, Inc 821 Secon

| Company for Permit No.   | lame <u>AL</u><br>7201                       | ASK          | AN          | COP                       | PER            | WORKS-E.MARGINAL WAY Station No. A4009 |                |             |                         |             |          |   |           | Month TAN VARY  Site No. N/A |            |          |                 |               |                 |             |               |  |    | ڪو              | ප   | No. of I               | i Industry Ty |                                       |                        |               |
|--------------------------|--|--------------|-------------|---------------------------|----------------|--|----------------|-------------|-------------------------|-------------|----------|---|-----------|------------------------------|------------|----------|-----------------|---------------|-----------------|-------------|---------------|--|----|-----------------|-----|------------------------|---------------|---------------------------------------|------------------------|---------------|
| <del></del>              |  | ſ            |             |                           |                | <del></del>                            |                | Stat        | ion N                   | 10          |          | -   |           | !                            | ï          | ,        | Ţ               | <del></del>   | Site            | NO.         | T             | Ť  | ;  |                 | 1   | T                      | :             | All units mg/                         | unless otherwise not   | ed industry i |
| SAMPLE DATES<br>(Gircle) | SAMPLE TYPE<br>Daily, Composite,<br>or Grab) | Z Z          | MAX         | SETTABLE<br>SOLIDS (mi/l) | OIL & GREASE   | Arsanic. As                            | Aluminum, Al   | Cadmium, Cd | Chromium, Cr<br>(Total) | Copper, Cu  | Lead, Pb | Mercury. Hg                                   | N.C.R. N. | Selenium, Se                 | Silver, Ag | Zinc, Zn | Total Metals    | Cyanide, CN.A | Cyanide, CN.1   | Fluorene, F | Phosphorus, P |  |    |                 | 110 | Flow<br>(GPD)<br>Total | 0             | Flow<br>GPD)<br>fustrial              | Flow<br>(GPD)<br>Other | Comm          |
| 1                        |  |              |             |                           |                |  |                |             |                         |             |          |   |           |                              |            |          |                 |               |                 |             |               |  |    |                 |     |                        |               |                                       |                        |               |
| 2                        |  |              | :<br>       |                           |                |  | 1              |             |                         |             |          |   | 1         |                              |            |          | 1               |               |                 |             |               |  |    |                 |     |                        |               |                                       |                        |               |
| 3                        |  | <u> </u>     |             | •                         |                |  |                | i<br>       | d)                      | 1           | _        |   | 2         |                              |            |          | Jan Y           |               |                 |             |               |  |    |                 |     |                        |               |                                       |                        |               |
| 4                        |  |              | $\triangle$ |                           |                |  | ·<br>-         |             | <del>-</del>            | Ţ           |          | <u> </u>                                      |           | )<br>                        |            | 1        | 12              | _             |                 |             |               | <u> </u>   |    |                 |     |                        | ļ<br>         |                                       |                        |               |
| 5                        |  |              | <u> </u>    | _<                        |                |  |                | ļ           | $\Delta$                | Q           | <u> </u> | <u>i                                     </u> | Ц         |                              | <u> </u>   | X        | $\sqrt{h}$      | L             |                 |             |               |  |    |                 |     |                        |               |                                       |                        |               |
|                          |  | ~            | U           |                           |                |  | <u> </u>       | -           | $\sim$                  |             | _        | <u> </u>                                      |           | <u> </u>                     | <u> </u>   |          | 1               | 1             |                 |             |               |  |    |                 |     |                        |               |                                       |                        |               |
| 7                        |  | 77           | _           | 7                         |                |  | ·              |             | <u>U</u>                | U           | <u> </u> | ļ   | _         |                              |            | 1        | $p_{\parallel}$ |               |                 | <u> </u>    | <u> </u>      |  |    |                 |     | 1294                   | <b>&gt;</b>   | · · · · · · · · · · · · · · · · · · · |                        |               |
| 8                        |  |              |             | <u> </u>                  |                |  |                |             | -                       | <u> </u>    |          | -   | -         | :                            | <b> </b>   |          | ļ               |               |                 |             |               |  |    |                 |     |                        |               |                                       |                        |               |
| 9                        | 1.00   |              |             |                           |                |  | -              |             |                         |             | _        | -   | <u> </u>  | <u>.</u>                     |            |          | <del> </del>    | <del> </del>  | <u> </u>        |             |               |  |    |                 |     |                        | <u> </u>      |                                       | <u> </u>               |               |
| 10                       |  |              |             |                           |                |  |                |             |                         | <del></del> | -        |   |           | -                            | _          |          |                 | -             | <u> </u>        |             |               |  |    |                 |     |                        |               |                                       | ļ                      |               |
| 11                       |  |              |             | <del></del>               |                |  |                |             |                         | -           |          | -   |           |                              | _          | _        | -               | -             |                 |             | -             |  | _  |                 |     |                        |               |                                       | <u> </u>               |               |
| 12                       |  |              |             |                           |                |  |                |             |                         |             |          |   |           | <u> </u>                     | -          | _        |                 | ļ             |                 |             |               | <del>                                     </del> | _  |                 |     |                        |               |                                       | -                      |               |
| 13                       |  |              |             |                           | $\dashv$       | -                                      |                |             |                         |             |          |   |           | -                            |            | -        |                 |               |                 |             |               | -  |    |                 |     |                        |               |                                       | <del> </del>           | ·····         |
| 14                       |  |              |             |                           | $\dashv$       |  |                |             |                         |             |          |   |           | -                            |            |          | -               | -             |                 |             |               |  |    |                 |     |                        |               |                                       | ļ                      |               |
| 15                       |  |              |             |                           |                |  |                |             |                         |             |          |   |           |                              |            |          |                 |               |                 |             |               |  |    |                 |     |                        |               |                                       | <del></del>            |               |
| 16                       |  | <del></del>  |             |                           |                |  |                |             | •                       |             |          |   |           |                              |            |          |                 |               |                 |             |               | -  |    |                 |     |                        |               | .,                                    | -                      |               |
| 17                       |  | +            |             |                           |                |  | •              |             |                         |             |          |   |           | •                            |            |          |                 |               |                 |             |               |  |    |                 |     |                        |               |                                       |                        |               |
| 18                       |  |              |             |                           |                |  |                |             |                         |             |          |   |           |                              |            |          |                 |               |                 |             |               |  |    |                 |     |                        |               |                                       | +                      |               |
| 19<br>20                 |  | <del>-</del> |             |                           | -+             |  |                |             |                         |             |          | -   |           |                              |            | -        |                 | -             |                 |             |               |  |    |                 |     |                        |               |                                       | •                      |               |
| 21                       |  |              | •           |                           | $\dashv$       |  | •              |             |                         |             |          |   |           |                              |            |          |                 |               |                 |             |               | -  |    |                 |     |                        |               |                                       |                        |               |
| 22                       |  |              |             |                           | $\dashv$       |  |                |             |                         |             |          |   |           |                              |            |          |                 |               |                 |             |               | <del>   </del>                                   |    |                 |     |                        |               |                                       |                        |               |
| 23                       |  |              |             |                           | $\dashv$       | :                                      | <del>- i</del> |             | •                       |             |          |   |           |                              |            |          |                 |               |                 |             |               | -  |    |                 |     |                        |               |                                       |                        |               |
| 24                       |  | <del></del>  |             |                           | $\neg \dagger$ |  |                |             |                         |             |          | 1   |           |                              |            |          |                 |               |                 |             |               | 1  |    |                 |     |                        |               |                                       | !                      |               |
| 25                       |  |              |             |                           |                |  | :              |             |                         |             | <u></u>  | -   |           |                              |            |          |                 |               |                 |             |               |  |    |                 |     |                        |               |                                       | 1                      |               |
| 26                       |  | <del></del>  |             |                           |                |  |                |             |                         | i           |          | <del></del>                                   |           |                              |            |          |                 |               |                 |             |               |  |    |                 |     |                        |               |                                       |                        |               |
| 27                       |  |              |             |                           | $\dashv$       |  |                |             | ····                    | 1           |          |   |           |                              |            |          |                 |               |                 |             |               |  |    | _               |     |                        |               |                                       | -                      |               |
| 28                       |  |              |             | •                         | 1              |  | <del>-</del>   | •           |                         |             |          |   | ·····•    |                              |            |          |                 |               |                 |             |               |  | 1  |                 |     |                        |               |                                       |                        |               |
| 29                       |  |              |             |                           | $\top$         | :                                      |                | - ;         |                         |             |          |   |           |                              |            |          |                 |               |                 | 1           |               |  |    |                 |     |                        |               |                                       |                        |               |
| 30                       |  |              | -           | -                         | 1              |  |                |             | :                       | 1           |          |   |           |                              |            |          |                 |               | $\neg \uparrow$ |             |               |  |    |                 |     |                        |               |                                       |                        |               |
| 31                       |  | _            | -           | ,                         | _              |  |                |             | •                       |             |          | +   | -         | _                            |            | -        |                 |               |                 | +           | _             |  |    | $\neg \uparrow$ |     |                        |               |                                       |                        |               |
| Min                      |  |              | -           | !                         | +              | 1                                      | -              | 1           |                         |             | 1        | _   |           |                              | -+         |          |                 |               | $\dashv$        | _           |               | _  | _  | _               |     |                        |               |                                       |                        |               |
| Max                      |  |              | •           |                           |                |  | <del>-</del>   | :           | :                       |             | +        |   |           |                              |            |          |                 |               | _               |             |               |  |    | 1               |     |                        |               |                                       |                        |               |
| Average                  |  |              |             |                           |                |  |                |             |                         |             | +        | <del></del> +                                 |           |                              |            |          |                 |               |                 | _           |               |  | -+ |                 |     |                        |               |                                       |                        |               |



### Waste Discharge Self Monitoring Report (Report On Only Those Parameters Specified By Your Permit)

Mail to: Metro, Inc. 821 Seco

MONTH THOM 1988 ALASKAN COPPER WORKS-E.MARGINAL WAY No. of Employees (per day) Average Station No. A4009 7201 Permit No. Site No. Industry T) All units mg/I unless otherwise noted SAMPLE DATES (Circle) SAMPLE TYPE (Daily, Composite, or Grab) Phosphorus, 4 Cyanide, CN. Total Metals Lead, Pb Flow Flow Flow (GPD) (GPD) (GPD) Other Commen 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 Min Max Average



### Waste Discharge Self Monitoring Report (Report On Only Those Parameters Specified By Your Permit)

Mail to Metro, Inc. 821 Secon

Month JANUARY 1988 ALASKAN COPPER WORKS-E.MARGINAL WAY No. of Employees (per day) Average 7201 Station No. A4009 Permit No. Site No. Industry Ty All units mg/I unless otherwise noted SAMPLE DATES (Circle) SAMPLE TYPE (Daily, Composite, or Grab) Cyanide, CN.A Total Metals Flow Flow Flow (GPD) (GPD) (GPD) Other Commen 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 Min Max Average

#### \*\*METRO

#### Waste Discharge Self Monitoring Report (Report On Only Those Parameters Specified By Your Permit)

Mail to Metro, Ir 821 Seci

Month JANUARY ALASKAN COPPER WORKS-6th AVE. SOUTH No. of Employees (per day) Average Company Name 7238 A4010 Permit No. Station No. Site No. All units mg/I unless otherwise noted Industry T SAMPLE DATES (Circle) SAMPLE TYPE Daily, Composite, or Grab) Silver, Ag Flow Flow (GPD) (GPD) (GPO) Total Industrial Other Comme 1 2 3 4 5 6 7 8 9 10 11 RE-SUBMI 12 13 14 15 16 17 18 19 20 21 22 23 24 0 25 0 -1500 27 28 29 30 31 Min Max Average

#### #metro

### Waste Discharge Self Monitoring Report (Report On Only Those Parameters Specified By Your Permit)

Mail to: Metro, In 821 Seco

ALASKAN COPPER WORKS-6th AVE. SOUTH Month JANUARY 1988 No. of Employees (per day) Average 7238 A4010 Permit No. W/A Station No. Site No. All units mg/I unless otherwise noted Industry T SAMPLE DATES (Circle) SAMPLE TYPE rDaily, Composite or Grab) Load, Pb Flow (GPD) (GPD) (GPD) Total industrial Other Commer 3 6 8 9 10 11 RESUBMIT 12 13 14 15 16 17 18 19 20 21 \_22 23 24 25 -26 1500 27 28 29 30 31 Min Max Average

#### **%**METRO

### Waste Discharge Self Monitoring Report (Report On Only Those Parameters Specified By Your Permit)

Mail to Metro, Ir 821 Seci

| Company I                |  |  | AN   | COP                       | PER          | WO           | WORKS-6th AVE. |  |                         |            |               |               |             |                         | ith 놀      | JANUARY<br>Site No. W/A |                |                |               |             |               | 1988 |   |               | No. of E  | 20                     |  |       |  |          |       |
|--------------------------|--|--|--|---------------------------|--------------|--------------|----------------|--|-------------------------|------------|---------------|---------------|-------------|-------------------------|------------|-------------------------|----------------|----------------|---------------|-------------|---------------|------|---|---------------|---|------------------------|--|-------|--|----------|-------|
| Permit No.               | 7238   | 7238   |  |                           |              |              | Station No     |  |                         | A4010      |               |               |             |                         |            |                         |                | Site No. W/A   |               |             |               |      |   |               | No. of Employees (per day) Average  All units mg/l unless otherwise |                        |  |       |  | Industry |       |
| SAMPLE DATES<br>(Circle) | SAMPLE TYPE<br>(Daily, Composite<br>or Grab) | MIN  | pH<br>XVW                                    | SETTABLE<br>SOLIDS (ml/I) | OIL & GREASE | Arsenic, As  | Aluminum, At   | Cadmium, Cd                                      | Chromium, Cr<br>(Total) | Copper, Cu | Load. Pb      | Mercury. Hg   | Nickel, Ni  | Selenium Se             | Silver, Ag | Zinc, Zn                | Total Metals   | Cyanide, CN.A  | Cyanide, CN,1 | Fluorene, F | Phosphorus P  |      | 4 |               | 110   | Flow<br>(GPD)<br>Total | Fk<br>(GF<br>Indu                      | PD)   | Flow<br>(GPD)<br>Other                           |          | Comm  |
| 1                        |  | ļ  | •  | i<br>+                    | <u> </u>     |              |                |  |                         |            |               |               |             |                         |            |                         |                |                |               |             |               |      |   |               |   |                        |  |       |  |          |       |
| 2                        |  | -  | <u>.                                    </u> |                           |              |              |                |  |                         |            |               |               |             |                         |            |                         |                |                | ļ             |             |               | ļ    | <u> </u>                                |               | <u> </u>  |                        |  |       | _  |          |       |
| 3                        |  | -  | •  | <del> </del>              | -            | <b>K</b>     | 10             | <b>\</b>   | _                       |            |               | -             | 7 1 2       | _                       | -          | 1-                      | , ,            |                | 22            | -           |               |      |   | -             | _   |                        |  |       |  |          |       |
| 4                        |  | +  | <u>:</u>                                     | -                         | -            | 1            | 70             | _  | E                       | <b>-</b> . |               | -             | H           |                         | 7          | /                       | 4              | 8              | $\Box$        |             | <b>&gt;</b> / | V    | 14                                      | 7             | =   |                        |  |       |  |          |       |
| 5                        |  | -  | <del> </del>                                 |                           |              | 7.           | IX             | ~  |                         | <b>\</b>   | \\            |               | 1           | $\overline{\mathbf{v}}$ | 7          |                         |                |                | T             | 7           | - A           | )R   | DE                                      |               |   | <b>-</b>               |  |       |  |          | ····· |
| 7                        |  | +-   | <del> </del>                                 | -                         |              | Y            | 7              |  | <b>&gt;</b>             |            | 717           | 3/            | 7           | +                       | _          |                         | *              | -              | 7             | $\preceq$   |               |      | Z.                                      | <u> </u>      | 7   |                        |  |       | !  |          |       |
| 8                        |  | T  | •  |                           |              |              | $\prec$        | d  | =                       | (          | =1            |               | -           | 7                       | <b>~</b>   | =7                      |                |                | ~~            | 5 <i>F</i>  | 7             | 1    |   |               |   |                        |  |       |  |          |       |
| 9                        |  |  | <b>.</b>                                     |                           |              | 7            |                |  |                         |            |               |               |             |                         |            |                         |                |                |               | - 4         |               | ナ    |   |               |   |                        |  | ····· | +  |          |       |
| 10                       |  |  |  |                           |              | A            | 1              | 7  | A                       | 10         | DI            | $\pi$         | 0           | S                       | N          |                         | च              | 7              | 7             | 1           | JE            | Ź    | J                                       | T             |   |                        |  |       |  |          |       |
| 11                       |  |  |  |                           |              |              |                |  |                         |            |               |               |             |                         |            | $\sim$                  |                |                |               |             | ĺ             |      |   | 1             |   |                        |  |       |  |          |       |
| 12                       |  |  |  |                           |              | 3            | A              | M  | 5                       | 7          |               | b             |             | <                       | >          | K                       | U              | 7              | Z'            | ST.         | 72            | II   | $\mathcal{T}$                           | 7             | 7   |                        |  |       |  |          |       |
| 13                       |  |  |  |                           |              | _            |                |  |                         | 7          |               |               |             |                         |            |                         |                |                |               |             |               |      |   | `             |   |                        |  |       |  |          |       |
| 14                       |  |  |  |                           |              | A            | $\Rightarrow$  | •  | 卫                       |            | $\mathcal{U}$ |               | $\triangle$ | T                       | $\equiv 1$ | $\geq$                  |                | 3              |               | 4           | $\geq$        | N    |   |               |   |                        |  |       |  |          |       |
| 15                       |  |  |  |                           |              | · i          |                |  | _                       |            |               | —į            |             |                         |            |                         |                |                |               |             |               |      |   |               |   |                        | ······································ |       | <u> </u>   |          |       |
| 16                       |  | <del>                                     </del> |  | -                         | $\dashv$     |              |                | i.   |                         |            | _             | $\dashv$      | _           |                         |            |                         |                |                |               | <del></del> |               |      |   |               |   |                        |  |       |  |          |       |
| 17                       |  | ├  |  | +                         |              |              |                |  | $\dashv$                |            | <u>i</u>      | _             |             |                         |            |                         | <u>;</u>       |                |               |             |               |      |   |               |   |                        |  |       |  |          |       |
| 18                       |  | <del>                                     </del> | <del></del>                                  |                           | $\dashv$     |              | <del></del>    |  |                         |            |               | $\dashv$      | +           |                         | $-\dagger$ |                         | -              |                |               | · · · · · · |               |      |   |               |   |                        | <del></del>                            |       |  |          |       |
| 20                       | ***************************************      |  |  | •                         |              |              |                |  | +                       |            | _             |               | +           |                         |            |                         |                |                | •             |             |               |      |   | •             | $\dashv$  |                        |  |       |  |          |       |
| 2:                       |  | <b></b>  |  |                           | _            | •            |                |  | 1                       | 1          |               | 1             |             |                         |            |                         | - :            |                |               |             | <del>i</del>  |      | <del>+</del>                            | <del></del> i |   |                        |  |       |  |          |       |
| 22                       |  |  |  |                           |              |              |                | <u> </u>   | 1                       | 1          | <del></del>   |               |             |                         |            |                         |                |                | :             | :           |               |      |   |               |   |                        |  |       | •  |          |       |
| 23                       |  |  |  |                           |              |              |                |  |                         |            |               |               |             |                         |            |                         | 10             |                |               |             |               |      |   |               |   |                        |  |       | 1  |          |       |
| 24                       |  | _  | Δ  | !<br>خوست                 |              |              |                | -  | N                       |            |               |               |             |                         |            | ^                       | X              |                | į             |             |               |      |   |               |   |                        |  |       |  |          |       |
| 25                       |  | 0  | Y  | 7                         | _            |              |                | i  | Ŏ                       | 0          |               |               | Ō           |                         |            | O                       | K              |                | :             |             |               |      |   |               |   | i                      |  |       |  |          |       |
| -26                      |  |  | N  | $\overline{\Lambda}$      | _            |              | -              |  |                         | ~          | - ;           |               | •           | _                       |            | •                       |                |                |               |             |               |      |   |               |   |                        | ,                                      |       |  |          |       |
| 27                       |  | V  | 3  | <u>\</u>                  | _            |              |                | -  | 0                       | U          | _             |               | O           |                         | _          | 0                       | 0              |                | -             |             |               |      |   | -             | _   | 1500                   |  |       | -  |          |       |
| 28                       |  |  |  |                           | $\dashv$     |              |                | <del></del>                                      |                         |            | _             |               |             | $\dashv$                |            | _                       |                | _              |               | <del></del> |               |      |   |               | _   |                        |  |       |  |          |       |
| 29                       | i  | -  |  | +                         | +            |              | <del>-</del>   | <del>- i</del>                                   | +                       |            |               | -+            |             |                         |            |                         |                |                |               |             |               |      |   |               |   | i                      |  |       | <del>                                     </del> |          |       |
| 30                       |  | +  | $\dashv$                                     | +                         | $\dashv$     | 1            | 1              | -  | -+                      | $\dashv$   | +             | +             |             | -                       |            | -                       | <del>-  </del> |                |               |             | -+            |      | +                                       |               | $\dashv$  |                        |  |       |  |          |       |
|                          |  | <u>:</u>   | $\dashv$                                     | +                         | +            |              | -              | _  | +                       | $\dashv$   |               | $\overline{}$ | $-\dot{+}$  | $\dashv$                | $\dashv$   | -                       |                | <del>-  </del> |               | -           | -             | -+   |   |               | $\dashv$  |                        |  | ····  | +  |          |       |
| Min<br>Max               |  | +  | -+   | <del>-  </del>            | +            | <del>-</del> | +              | <del>-                                    </del> | +                       | $\dashv$   | +             | -             | -           | -+                      | $\dashv$   | -                       |                |                | 1             |             |               | +    |   | -             | -+  |                        | · · · · · · · · · · · · · · · · · · ·  |       | :  |          |       |
| Average                  |  |  | <del>-</del>                                 |                           | _            |              |                | -+-  |                         | +          | +             | +             |             |                         | +          |                         |                |                |               |             | -+            | -+   |   |               | $\dashv$  |                        |  |       |  |          |       |
|                          |  |  |  |                           |              |              |                |  | <del></del>             |            |               |               |             |                         |            |                         |                | <del></del>    | <u> </u>      |             |               |      |   |               |   |                        |  |       |  |          |       |

## Laucks Testing Laboratories, Inc.

Certificate

940 South Harney St., Seattle, Washington 98108 (206)767-5060

Chemistry Microbiology and Technical Services

CLIENT: Alaskan Copper Works

P.O. Box 3546 Seattle, WA 98124 ATTN: Jim Brown LABORATORY NO. 7659

DATE: Jan. 13, 1988

PO# M4693

REPORT ON: LIQUID

SAMPLE

IDENTIFICATION: Submitted 01/07/88 and identified as shown below:

1) ID# 3200-M4693 2) ID# 3600-M4693

TESTS PERFORMED AND RESULTS:

|   | 1     |       |
|---|-------|-------|
| Specific Gravity @ 70°F                                       | 1.272 | 1.090 |
| Total Acidity calculated as, % HNO3 (methyl orange end point) | 7.5   | 6.0   |

Respectfully submitted,

Laucks Testing Laboratories, Inc.

J. M. Owens

JMO:emt

